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571-273-1079

FROM: Gary D. Mangels, Ph.D. Telephone #: 703 838 6587

Date 8/21/2009

Reference No. Appln. No. 10/682,412, Our reference: 1004900-000254

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Application No.: 10/682,412
Attorney's Docket No. 1004900-000254

August 21, 2009

Examiner Sergeant :

Thank you for the telephone call he other day. As we discussed, enclosed below is documentation as to why we believe the current claims are not anticipated by EP032591 based on the weight ratio requirements in the claims.

The current claims recite:

44. A low-viscosity polyfunctional isocyanate composition comprising at least one uretidinedione isocyanate dimer and at least one trimer having a biuret function, wherein said biuret function containing trimer represents at least 10% by weight based on the weight of the composition and the weight ratio of true dimer units/total of isocyanate functions is $\leq 30\%$.
45. A low-viscosity polyfunctional isocyanate composition comprising at least one uretidinedione isocyanate dimer and at least one trimer having a biuret function, wherein said biuret function containing trimer represents at least 20% by weight based on the weight of the composition and the weight ratio of true dimer units/ total of isocyanate functions is $\leq 30\%$.
46. A composition comprising:
- at least one polyisocyanate composition according to claim 45; and
 - a polyol.
47. A composition comprising:
- at least one polyisocyanate composition according to Claim 45; and
 - an acrylate polyol which satisfies the following conditions for a dry extract:
 - Mw (weight-average molecular weight) not greater than 10,000;
 - Mn (number-average molecular weight) of not greater than 5000;
 - Mw/Mn (dispersity ratio) of not greater than 5; and
 - number of OHs/molecule of greater than or equal to 2.
48. A composition comprising:
- at least one polyisocyanate composition according to Claim 45; and
 - a polyester polyol having a viscosity of not greater than 10,000 mPa.s at 25°C, and an Mw of between 250 and 8000.
49. A composition according to claim 46, containing a crosslinking catalyst, which is optionally a latent catalyst.

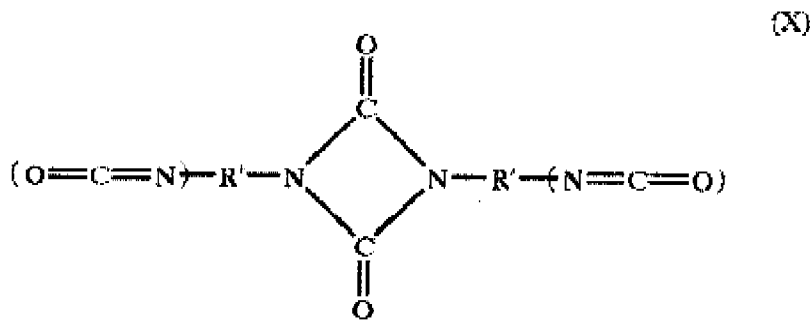
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Claims 44 and 45 recite, in relevant part, the weight ratio of true dimer units/ total of isocyanate functions is $\leq 30\%$. Claims 46-49 depend from claim 45 and therefore contain the same limitation.

Page 20, lines 11-12 of the specification states: The true dimers are the compounds of general formula X above. The compounds of general formula (X) have the following structure, in which the ring structure is a uretidinedione:



EP0325941 teaches the NCO content is from 20 to 24 weight % and the uretidinedione group (calculated as $\text{C}_2\text{N}_2\text{O}_2$) is from 4 to 20 weight %.

The preferred procedure products according to invention on basis of 1,6-Diisocyanatohexan point with 23 DEG C a viscosity from 300 to 5000 mPa.s, to NCO content from 20 to 24 Gew. - % and content at Uratdiongruppen (calculated as $\text{C}_2\text{N}_2\text{O}_2$) from 4 to 20 Gew. - % up. Beside these groupings are present in the procedure products according to invention Biuret, urethane and isocyanate groups as well as if necessary Alkylphosphatgruppen.

The claims of the instant application require the weight of the true dimer units. As seen from the general formula (X) above, the true dimers include the group R'. EP0325941 teaches that the diisocyanates used have molecular weights in the range of 140 to 300.

For the invention process suitable Ausgangsdiisocyanat is arbitrary organic diisocyanates with aliphatic and/or cyclo-aliphatic bonded isocyanate groups of the molecular weight range 140 to 300 or their mixtures. Examples are 1,4-Diisocyanatobutan, 1,6-Diisocyanatohexan, 1,6-Diisocyanato-2,2,4-trimethyl-hexan, 1,12-Diisocyanatododecan, Lysin-C1-C8-alkylester-diisocyanat, 1,3-Diisocyanatocyclobutan, 1,3- and/or 1,4-Diisocyanatocyclohexan, 3,3-bis-Dimethyl-4,4-bis-Diisocyanatodicyclohexylmethan, 4,4-bis-Diisocyanatodicyclohexylmethan, 1-Isocyanato-3,3,5-trimethyl-5-isocyanatomethylcyclohexan or 1,4-Xylylendiisocyanat. Particularly preferred becomes 1,6-Diisocyanatohexan (HDI) as Ausgangsdiisocyanat used.

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For a diisocyanate with a molecular weight of 140, the molecular weight of the aliphatic group in the diisocyanate is:

$$140 - \text{M.W. of } \text{C}_2\text{N}_2\text{O}_2$$

or

$$140 - [(12 \times 2) + (14 \times 2) + (18 \times 2)] =$$

$$140 - [24 + 28 + 36] =$$

$$140 - 88 = 52$$

Therefore the lowest molecular weight dimer taught in EP0325941 has the formula (X), where each R' has a molecular weight of 52. The molecular weight of such a dimer is calculated as :

$$[4 \times (\text{NCO})] + [2 \times \text{R}'] =$$

$$[4 \times (14 + 12 + 16)] + [2 \times 52] =$$

$$[4 \times 42] + 104 =$$

$$168 + 104 = 272$$

In EP0325941, the weight of the uretidinedione group (calculated as $\text{C}_2\text{N}_2\text{O}_2$) is from 4 to 20 weight %. The mass of the group $\text{C}_2\text{N}_2\text{O}_2$ represents 84/272 or 31% of the uretidinedione group. The mass of the uretidinedione group, as the percent weight of the composition can be calculated as shown below:

$$\underline{4 \% \text{ composition} = 31\% \text{ of the uretidinedione group}}$$

$$X \% \text{ composition} = 100\% \text{ of the uretidinedione group}$$

or

$$(4 \times 100) = 31 \times$$

or

$$(4 \times 100)/31 = x$$

or

$$x = 12.9\%$$

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The claims of the instant application require the weight ratio of true dimer units/ total of isocyanate functions is $\leq 30\%$. In EP0325941 the minimum weight of the true dimer is 12.9% of the total composition, as shown above. EP0325941 teaches that the weight of the isocyanate function is from 20-24%. The lowest weight ratio of true dimer units/ total of isocyanate functions taught in EP0325941 can be calculated by dividing the weight of lowest dimer unit allowable by the maximum weight allowed for the total of the isocyanate functions.

$$\frac{\text{weight of lowest dimer unit}}{\text{maximum weight of total of the isocyanate functions}} = \frac{12.9\%}{24\%} = \underline{\underline{53\%}}$$

Therefore the the weight ratio of true dimer units/ total of isocyanate functions is at least 53%, which is not $\leq 30\%$, as required by the claims.

Therefore the claims of the instant application cannot be anticipated by EP0325941 since every element is not disclosed in EP0325941.

I look forward to our discussion next week.

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